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AGRIBUSINESS AND TRADE PROMOTION (USAID ATP)

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**One study/assessment of an innovation, including the
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CARANA Corporation



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INNOVATIONS IN VALUE CHAIN LOGISTICS

AGRIBUSINESS AND TRADE PROMOTION (ATP) PROJECT



April 2013

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DISCLAIMER

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CONTENTS

CONTENTS.....	III
ACRONYMS	IV
EXECUTIVE SUMMARY	V
1. INTRODUCTION	I
2. METHODOLOGY	2
3. FINDINGS - DESK REVIEW AND FIELD VISIT OBSERVATIONS.....	3
3.1 CURRENT WEST AFRICAN VALUE CHAIN FINDINGS - CEREAL	3
3.2 CURRENT WEST AFRICAN VALUE CHAIN FINDINGS – LIVESTOCK	5
3.3 DEVELOPED MARKET VALUE CHAIN LOGISTICS OVERVIEW	7
3.4 ROLE OF INNOVATION IN VALUE CHAIN LOGISTICS	9
4. RECOMMENDATIONS	11
4.1 CEREAL MARKET LOGISTICS INNOVATIONS.....	12
4.1.1 Standard Maize Bag Exchange.....	13
4.1.2 Preferred Supplier-Shipper-Customer Program	14
4.1.3 Portable Grain Dryers.....	15
4.2 LIVESTOCK	16
4.2.1 Slip Resistant Floors Livestock Transportation Equipment.....	17
4.2.2 Driver Training – Certification Program Livestock Transportation	18
4.2.3 Mobile Abattoir	19
4.2.4 Seafood Container Backhauls	20
ANNEX 1-DESK REVIEW	21
ANNEX 2-EQUIPMENT INFORMATION.....	22

ACRONYMS

USAID	United States Agency for International Development
ATP	Agribusiness Trade Promotion
E-ATP	Expanded Agribusiness and Trade Promotion
WATH	West Africa Trade Hub
QA	Quality Assurance
HACCP	Hazard Analysis and Critical Control Points
VC	Value Chain
VCA	Value Chain Actors
PPP	Public Private Partnership
COA	Certificate of Analysis

EXECUTIVE SUMMARY

Throughout the field work and studies produced under the USAID ATP and E-ATP, there exists a common recognition that many of the prevailing issues which inhibit the effective flow of goods and services through the West African regional agricultural value chains can only be addressed through large scale upgrades in infrastructure, improvement in regional trade policy and fundamental shifts in generally accepted business practices. The impetus behind this study is an observation that while these larger undertakings take a long time, in the short term it is possible to make highly targeted innovations in logistics activities to help bring about measureable increases in trade, for the benefit of all value chain actors.

Utilizing the data compiled by the multitude of ATP and E-ATP value chain studies and augmenting them with field work and site visits conducted in Ghana in April 2013, the objectives of this study include identifying logistics initiatives which are innovative in nature but remain mindful of the prevailing West African business practices and economic realities. The research and resulting recommendations also take into account that innovation is a subjective term, and what is common business practice in a highly developed value chain may be perceived as exceedingly innovative in a lesser developed market.

The initiatives put forth in this study will attempt to address some of the most pressing value chain concerns highlighted in the previous studies and confirmed by the site visits. The recommendations will be constructed and presented as to take into account and identify:

- Value Chain Priorities
- Level and Nature of Constraints
- Potential Core Value Chain Actor Participants
- Potential Additional Partners
- Reasonable Timelines
- Key Performance Indicators

1. INTRODUCTION

The Agribusiness and Trade Promotion (ATP) project is a four-year regional initiative funded by the United States Agency for International Development (USAID). Launched in 2008, USAID ATP has focused on three agricultural value chains: maize, onion, and ruminant livestock/red meat. The Expanded Agribusiness and Trade Promotion (E-ATP) project is a three-year regional initiative launched in 2009. Building on the success of USAID ATP, USAID E-ATP has focused on three additional value chains: poultry, rice and millet/sorghum.

Both USAID ATP and E-ATP aim to increase the value and volume of intra-regional agricultural trade in their respective value chains and their associated activities along the major commercial corridors linking Senegal, Mali, Burkina Faso, Benin, Togo, Ghana, Côte d'Ivoire, and Nigeria. The two projects are designed to contribute to achieving the 6 percent annual agricultural growth target set under the Comprehensive Africa Agriculture Development Program (CAADP) of the African Union's New Partnership for Africa's Development (AU-NEPAD).

Inefficiencies in West Africa's logistics systems are a recognized constraint to trade within the region. Such inefficiencies increase supply chain costs for traders through, for example, increased time to market and product spoilage. The project's transport teams have conducted, in FY 2010-2011, transport and logistics cost studies of each of USAID ATP's target value chains. These studies focused on identifying key locations where investments in logistics infrastructure and public-private partnerships have the potential to greatly enhance intra-regional trade. They also identified priority public investments in road infrastructure along the target corridors for each value chain.

Development of infrastructure – whether that of roads or markets – is a long-term, expensive endeavor. Single traders or businesses are in short term more likely to benefit from solutions which go around these infrastructural constraints. This assessment of innovations in value chain logistics aims to be beneficial for value chain actors in its focal value chains by informing them of potential innovations that they could adopt in their work.

2. METHODOLOGY

This study identified and highlighted potential targeted logistics innovations in livestock and cereal value chains. Both of these value chains play a critical role in the economies of West African countries and in the livelihoods and food security of their populations. The innovations identified are designed to address the most conspicuous logistics deficiencies while remaining cognizant that many of the fundamental inhibitors afflicting these value chains remain outside of the scope of the direct value chain actors.

The specific approaches used to accomplish this study were:

1. Perform a Desk Review of available documentation on cereal and livestock markets, transport and logistics procedures and challenges in West Africa.
2. Conduct Desk Research on livestock and cereal logistics practices in developed markets which may inform potential innovations for West African agricultural value chains.
3. Conduct Field Research in Ghana, in particular research at the Tema Livestock and Techiman Grain Markets.

3. FINDINGS - DESK REVIEW AND FIELD VISIT OBSERVATIONS

Below are some of the key findings from previous ATP and E-ATP livestock and cereal market, transport and logistics studies. The reoccurring theme is a challenging production, wholesale, retail and transport environment, where even in major markets such as the Techiman Grain Market and the Tema Livestock Market, there are fundamental logistics principals being routinely violated. These logistics shortcomings place the operators in undeniably chaotic logistical circumstances which lead to high losses and compressed margins. Furthermore, without innovative changes in the fundamental ways in which the logistics are organized, current value chain actors will be limited to exclusively participate in traditional, lower margin value chains although higher margin value chains continue to develop around them.

3.1 CURRENT WEST AFRICAN VALUE CHAIN FINDINGS - CEREAL

Techiman Wholesale Market:

The grain market located in Techiman, Ghana is one of the largest maize markets in West Africa. The market is the primary trading center for maize from the Brong Ahafo and Ashanti production regions. The market is under the management of the Techiman Municipal Authority with recognition given to the regional Maize Buyers-Sellers Association.

Due to continued market expansion, poor design, and limited or substandard infrastructure the market is chaotic and essentially completely void of generally accepted, developed market logistics essentials. Some of the deficiencies noted in previous ATP and E-ATP studies, confirmed by the researcher and addressed in subsequent recommendations, include:

- Lack of dedicated loading or unloading zones
- Trucks entering from multiple directions leading to gridlock conditions
- Accidents resulting from inadequate load staging areas
- Few covered areas to keep cereals dry during inclement weather
- Inadequate or nonexistent drying facilities leading to loading grain with inconsistent moisture content

- Arriving product loaded in bags of inconsistent sizes, weights, types and quality
- Redundant and non-value adding re-bagging
- Lack of scales resulting in inconsistent volumetric fills and actual weights
- Lack of adequate restrooms and running water
- Multitude of ancillary activities inconsistent with, and in many cases detrimental to standard market operations including:
 - Lodging
 - Cooking
 - Child Care
 - Laundry
 - Personal hygiene activities
 - Truck and auto repair
 - Recreational activities



Image depicting cereal unloading Techiman Grain Market

Cereal Transit:

- Informal non-professional environment void of standard processes and procedures
- Little to no lane pricing intelligence
- Informal transportation rate negotiations
- Inconsistent and substandard vehicles
- Inconsistent loading practices conducted without proper regard to load balancing
- Difficulty in obtaining appropriate export documentation
- Truckers often unaware of their obligations regarding appropriate documentation for their vehicles and their rights and obligations for various payments

3.2 CURRENT WEST AFRICAN VALUE CHAIN FINDINGS – LIVESTOCK

Tema Livestock Market

The livestock market the researcher visited during his field work is located in the coastal city of Tema, Ghana, approximately 25 kilometers from the capital city of Accra. For most of the incoming animals, the Tema Livestock Market represents the termination point after enduring, in many cases, a punishing journey of a 1,000 kilometers or more.

Inadequate infrastructure, improper or poorly maintained equipment, absent standard processes and procedures and limited market intelligence are some of many concerns afflicting the value chains for livestock in West Africa in general as well as the Tema Market specifically.

The most evident impediments concerning the value chain, many of which this report attempts to address in the subsequent recommendation, include:

Transportation:

- Underdeveloped logistics and trucking services
- Poor or nonexistent ramping
- Poor vehicle loading practices
- Non-standard vehicles
- Improper vehicle operation
- Improper and overloading of vehicles
- Animals not properly restrained
- Poor regional road conditions

Market:

- Lack of paddocks
- Inadequate feed and watering facilities
- Inadequate or inconsistent veterinary services
- Poor animal handling practices
- Prolonged sales transactions related to traditional practices and disorganization amongst numerous intermediaries

Abattoir:

- Poor hygiene
- Inconsistent slaughter tools and techniques
- Lack of or inconsistent inspection pre- and post-slaughter
- Lack of HACCP plans or documented adherence to any Critical Control Points



Image depicting Tema Livestock market conditions

3.3 DEVELOPED MARKET VALUE CHAIN LOGISTICS OVERVIEW

Developed market agricultural logistics systems are characterized by the ability of a public or private entity to supply goods and services in agreed quantities, of defined quality, and in accordance to a specific time and fee schedule.

While for every commodity there are multiple idiosyncratic value chain models and activities, the vast majority of highly effective value chains share common fundamental logistical best practices. In developed markets, leading value chain participants are exceedingly adherent to these best practices. They realize that logistics related activities constitute a major portion of a commodity's final market price which in turn dramatically affects the total end value to be shared between the chain's participants. Hence, there is an acute realization that well thought out logistics models rooted in generally accepted best practices, combined with sound execution and proper equipment can be an important source of a sustainable competitive advantage.

There may appear a disconnection in highlighting developed market logistics practices to the resource challenged value chain actors in the West African agricultural trade. However, recognizing and attempting to adapt the most relevant developed market best logistical practices to developing markets need not be an exceedingly costly endeavor. Return on investment from the adaptation of best practices and the limited introduction of new technology can be demonstrated through innovative pilot projects which in turn can stimulate early adopters and in the best cases eventually transform an entire value chain. It is also important to again stress that what is a common business practice in a highly developed value chain, may be perceived as extremely innovative in a lesser developed market and that innovation can occur at any phase of a value chain. Typical phases of a developed market agricultural value chain include:

- **Input:** This phase is concerned with the procurement of raw materials required for agricultural production, processing, and trade.
- **Production:** This phase is concerned with primary agricultural production and terminates with the sale of a raw commodity at the farm gate. Depending on the crop, some type of primary processing such as the drying, shelling or bulk bagging may take place.
- **Assembly/Intermediate Logistics:** This phase involves the assemblage of agricultural products from multiple farmers and transportation and delivery of the raw material to a plant for value added industrial processing or packaging. In the case of cereals, grading and final market bagging can also occur at this stage. In the case of livestock operations, assembly may include the feedlot process for the ultimate delivery of fattened animals to an abattoir.
- **Processing:** This phase involves the transformation of agricultural raw materials into one or more finished goods. Note: Raw commodities may skip this stage.
- **Final Logistics:** This phase is concerned with the delivery of traded commodities to their final market destination. This may include foreign markets in which case proper export procedures and documentation requirements are followed.

Highly developed value chains, regardless of the commodity or service, are characterized by the collaborative creation and adherence to a set of generally accepted best practice fundamentals including:

- Well defined value chain actors who organically and continuously rationalize weak and/or extraneous links and activities
- Continuous network optimization effort to make sure value chain is keeping up with shifting market requirements
- Each value chain actor focused on their core competencies
- Competitive and transparent pricing models
- Well defined and documented processes and procedures for even the most mundane activities
- Full understating and a collaborative definition of value chain actor roles and responsibilities
- Consistent use of commonly accepted proper packaging and labeling
- Common weight and unit standards
- Proper vehicle type and load stabilization for every move
- Proper handling, storage and intra-warehouse movement of goods
- Efficient use and limited downtime of all assets
- Appropriate incorporation of value adding information technology
- Hazard Analysis and Critical Control Point Plans where required
- Well defined, legislated and enforced sanitary programs
- Well defined, legislated and enforced work safety programs
- Well defined and accepted payment terms and conditions
- Clearly identified market dynamics with properly placed incentives and disincentives
- Formal and informal downstream feedback loops to communicate and address shortcomings

3.4 ROLE OF INNOVATION IN VALUE CHAIN LOGISTICS

Developed market agricultural firms have realized for some time that innovations are not limited to product, but can be extended to pioneering process and procedure integration, value added packaging and logistics services. Mature value chains have spent years harmonizing the demands and requests of their customers and value chain partners with the realities of their own economic models. The result has been a fundamental shift in how logistics is regarded and valued. The current developed market environment where both suppliers and logistics service providers, even those involved in highly commoditized markets, treat logistics activities not solely as a necessary evil but rather opportunistically as the potential source of a highly valued competitive advantage. The objectives of innovation activities in logistics have become more customer-oriented and less primarily cost-oriented. To this end the importance of collaborative customer driven innovations have become of paramount importance in the design and implementation of value chain logistics innovations.

Even in developed markets however, value chain innovation can be perceived as both expensive and risky. Therefore, it is hardly surprising when established developing market value chain actors discount the need to pursue innovative ideas in logistics. This can be especially evident when participating in their traditional domestic/regional markets. During the field work some of the common concerns the researcher heard from the value chain actors included:

- How can it make sense to spend heavily on innovation and improvements for a market in which customers have so few resources?
- How can a cash constrained value chain actor afford to implement the logistics practices of more advanced markets?
- The “common” populous genuinely does not care about or value programs surrounding food safety or sanitary retail conditions. They will always patronize vendor with the lowest price.
- An idea or system that may work in the developed world cannot be adapted to our reality.

These may all be legitimate observations and concerns, but it can be out of this authentic market knowledge that innovation can be conceived and nurtured. In fact, often the most successful innovation is born out of combining indigenous market intelligence with organizational and technological contributions from developed markets. The key is to persuade the most progressive relevant value chain actors and stakeholders that with proper focus the integration of home-grown market knowledge along with developed market input and assistance can eventually improve the entire sector value chain as well as the economic condition of the individual actors.

To be sure, there exists a clear role for the fundamental framework of the current West African value chains for both livestock and cereals. At the end of the day, the retail markets appear to have a reasonable supply as well as a functioning marketing effort of both staples in this study. As noted in the existing reports conducted under the ATP and E-ATP and witnessed by this researcher, these markets are, at least at a basic level, functioning and that a tremendous amount of commercial activity takes place under these current market conditions every day. However, that these traditional markets are essentially functioning does not mean there is not a role for targeted innovative logistics interventions and enhancements aimed at improving the overall value chains as well as the livelihoods of individual value chain actors. Additionally, when properly designed, implemented and maintained, these innovative logistics initiatives can be instrumental in addressing national/regional food security, food safety and nutritional concerns.

It should be noted, however, that in the researcher's opinion much of the traditional value chain market infrastructure in both sectors is either in such poor condition or its physical location is so out of sorts with fundamental network optimization that the researcher can not recommend that valuable and limited assistance efforts or financial resources be spent for their continued operation or potential rehabilitation.

Additionally, the researcher noted during his field visit that there exists a growing sector of parallel, higher-end value chains which appear wholly underserved by the traditional value chain actors. These markets are typically full of goods supplied by multinationals and niche local concerns. It does not appear there exists any formal barrier to entry or market rationale which would preclude additional progressive local value chain actors from soliciting a part of this business and potentially shifting the economic rewards away from the multinational concerns and into the local economies. The traditional value chain actors who are most quickly able to recognize these developing new value chains and seize the opportunity to upgrade their business practices in support of these parallel chains will be positioned well to reap the benefits of higher operating margins and the faster return on investment typically associated with doing business with higher value operations.

4. RECOMMENDATIONS

“If at first the idea is not absurd, then there will be no hope for it.” [A. Einstein]

The recommendations in this study were developed to address some of the most glaring value chain liabilities with approaches and programs which the researcher believes have potential with reasonable level of effort and financial resources.

Specifically the recommendations are designed to both improve the livelihoods of the individual value chain actors as well as to assist in addressing regional food security challenges by improving or taking advantage of:

- Extreme logistics shortcomings, inefficiencies and poorly positioned activities within current traditional market value chains
- Opportunities for traditional value chain actors to expand from exclusively serving traditional market value chains and create an opportunity to begin participation in growing higher margin markets
- Identification of partnering opportunities including potential Private Sector and Public Private Partnerships to finance and operate technological, informational and educational upgrades

4.1 CEREAL MARKET LOGISTICS INNOVATIONS



Image Depicting Inbound Maize at Techiman Grain Market- Poly Mesh Bags of various volumetric fill and weight are reloaded into cocoa bags.

4.1.1 STANDARD MAIZE BAG EXCHANGE

DESCRIPTION OF CURRENT SITUATION		RESULTING CONCERNS	
<p>I. Bags of various size and material enter the market where they are routinely opened and contents re-bagged. Rationalization given for re-bagging activity:</p> <ul style="list-style-type: none"> Bags enter market with inconsistent weight and volumetric fill Bags enter market in inconsistent conditions Contents require inspection/cleaning/sorting Farmers/traders want their actual bags returned 		<ul style="list-style-type: none"> Redundant limited value added activity Added cost and increased losses created by re-bagging activities Little actual sorting or cleaning- False sense of quality inspection No process/procedure for Quality Assurance of bags utilized for final retail market shipments Added market congestion created by re-bagging activity 	
LOGISTICS INNOVATION		LEVEL AND NATURE OF CONSTRAINT	
<p>I. Creation of Bag Exchange Program for selectively prequalified Traders/Farmers. The program will have the following characteristics:</p> <ul style="list-style-type: none"> A pool of qualified relatively high quality/cleanable bags to be rotated between VCA Products from qualified suppliers to arrive at market with rudimentary Certificate of Analysis allowing their flow through the market without necessitating re-bagging Trader/Farmer will receive one empty bag for each full bag entering the market Bag shipment records and accounting of program consignees will be kept Bags used in select retail markets when empty will be returned to a regional bag collection depot and retailer bag account will be credited Periodic full truck load of empty bags return to origin depot 		<p>LEVEL OF FINANCIAL CONSTRAINT: MODERATE LEVEL OF VCA/CULTURAL RESISTANCE: HIGH TIMELINE: MEDIUM</p> <ul style="list-style-type: none"> VCA are under the mistaken impression that re-bagging is actually a legitimate inspection/weighing/standardizing Disagreement on optimal standard bag Lack of consensus that product drying, grading, sorting, cleaning and final packaging can take place closer to farm gate and not under the supervision of the market Complexity in creating a program to qualify framers/traders/transporters/retailers Complexity of setting up, maintaining and enforcing accounting component of bag exchange program 	
KEY PERFORMANCE INDICATORS		CORE PARTICIPANTS	
<ul style="list-style-type: none"> Reduced time for product to transit through the market Reduced market congestion Reduced losses by eliminating sorting step and poor quality bags Improved sanitation VCA perceive value in participation demonstrated by increased interest in joining bag exchange program 		<ul style="list-style-type: none"> USAID Techiman Cereal Sellers Association Select progressive traders/farmers Select bag producers Select progressive cereals retailers and transporters 	
COMMENTS/RECOMMENDATIONS		POTENTIAL PARTNERS	
<ul style="list-style-type: none"> Study crate exchange programs in bottled beverages Study pallet exchange/rental models in developed markets GlZ who is in the planning stages of a complete infrastructure overhaul and logistics reengineering of the Techiman Grain Market should be consulted 		<ul style="list-style-type: none"> Ghana Grains Council GIZ Ministry of Agriculture Maize Sellers/Transportation/Retail Associations 	

4.1.2 PREFERRED SUPPLIER-SHIPPER-CUSTOMER PROGRAM

DESCRIPTION OF CURRENT SITUATION	RESULTING CONCERNS
<p>I. Retail market association leaders must dedicate effort and incur expense to routinely either travel themselves or assign representative to travel to cereal market and meet with selling association or trader in order to:</p> <ul style="list-style-type: none"> • Inspect product • Negotiate price and terms • Arrange transportation • Make payments 	<ul style="list-style-type: none"> • Added value chain costs • Duplication of effort • Travel expense • Safety involving cash transactions • Misplaced VC activity requiring retailer to travel to wholesale market principally for product inspection and payment • Added market congestion
LOGISTICS INNOVATION	LEVEL AND NATURE OF CONSTRAINT
<p>I. Creation of a Preferred Supplier-Shipper-Customer Network Qualification Program characterized by:</p> <ul style="list-style-type: none"> • Agreed upon and documented minimum product and bag standards • Rudimentary COA or Letter of Guarantee for each shipment • Order Minimums and Lead-times • List of Approved Transportation Associations or Individual Carriers and applicable tariff schedule • Agreed upon Payment Terms and Method of payment for each VCA 	<p>LEVEL OF FINANCIAL CONSTRAINT: LOW LEVEL OF VCA/CULTURAL RESISTANCE: MODERATE TIMELINE: MEDIUM Informal, minimally documented quality standards and preferred VC networks already exist, however:</p> <ul style="list-style-type: none"> • Lack of trust between VCA • Little history of documenting or guaranteeing product quality • Little history of providing COA • Many of VC activities still cash based • Bank Funds Transfer Infrastructure Access limited for VCA
KEY PERFORMANCE INDICATORS	CORE PARTICIPANTS
<ul style="list-style-type: none"> • VC begins to rationalize current informal transactions in favor of formal repetitive standard transactions • Network begins to rely on standard information exchange and guarantees instead of repetitive manual inspection • Network begins to make use of standard payment terms and methods of exchanging funds • Each VCA able to concentrate on their core competency • Additional VC participants interested in joining preferred network 	<p>Select Progressive:</p> <ul style="list-style-type: none"> • Market Retailers • Selling Associations and/or Traders • Transportation Associations • Financial Institutions <p>USAID-Network Consultant</p>
COMMENTS/RECOMMENDATIONS	POTENTIAL PARTNERS
<ul style="list-style-type: none"> • Such relationships common in developed markets • Program can be used in combination with Standard Bag Exchange Program outlined in previous recommendation 	<ul style="list-style-type: none"> • Ghana Grains Council • GIZ

4.1.3 PORTABLE GRAIN DRYERS

DESCRIPTION OF CURRENT SITUATION		RESULTING CONCERNS	
Individual farmers and traders deliver bagged cereals to market with inconsistent levels of moisture and without any documented quality certificates.		<ul style="list-style-type: none"> • All bags are opened in the market for inspection and re-bagging • Misuse of valuable market grounds to lay out grain to sun-dry which becomes impossible during inclement weather • Inaccurate or misrepresented product weight • Product loss/rot when packaged with high humidity • Fosters lack of confidence/trust amongst VCA • Limits VCA to traditional lower margin outlets 	
LOGISTICS INNOVATION		LEVEL AND NATURE OF CONSTRAINT	
<p>1. Work with progressive VCA who together can investigate opportunities to introduce to farmers, associations and/or traders a limited number of mobile grain dryers. Grain dried to an agreed standard will be bagged once, a COA will be created and grain will be presented for sale based on results documented on certificate and, if required, small random quality test. Coordination amongst VCA and potential technical assistance providers include:</p> <ul style="list-style-type: none"> • Potential financing options • ROI analysis • Specification of required units • Training of Mobile unit operation • Creation of a standard COA or other Quality Control Guarantee Documents 		<p>LEVEL OF FINANCIAL CONSTRAINT: HIGH LEVEL OF VCA/CULTURAL RESISTANCE: MODERATE TIMELINE: MEDIUM</p> <ol style="list-style-type: none"> 1. Lack of consensus related to scale of problem 2. Established business practices dictate: <ul style="list-style-type: none"> • Sun-drying grain at the market • Inspecting grain at the market • Re-bagging grain at the market 3. Little to no expertise working with quality certificates/guarantees 4. Buyers may still want to re-bag grain into their preferred bag 	
KEY PERFORMANCE INDICATORS		CORE PARTICIPANTS	
<ul style="list-style-type: none"> • With the introduction of automated grain drying equipment VCA are able to consistently achieve a desired level of moisture content • VCA begin to transact sales based on certification rather than full inspection • VCA begins to realize reduction in loss due to rot • VCA begins to express interest in financing and procuring additional drying units 		<p>Select Progressive:</p> <ul style="list-style-type: none"> • Market Retailers • Selling Associations and/or Traders • Transportation Associations • Financial Institutions <p>USAID-Network Consultant</p>	
COMMENTS/RECOMMENDATIONS		POTENTIAL PARTNERS	
<ul style="list-style-type: none"> • Program can be used in combination with Standard Bag Exchange Program and Preferred Supplier-Shipper-Customer Program outlined above 		<ul style="list-style-type: none"> • Ghana Grains Council • GIZ 	

4.2 LIVESTOCK



Image Depicting Livestock unloading at Tema Livestock Market

4.2.1 SLIP RESISTANT FLOORS LIVESTOCK TRANSPORTATION EQUIPMENT

DESCRIPTION OF CURRENT SITUATION	RESULTING CONCERNS
<p>High livestock mortality rate in large part due to falling and trampling as animals are routinely overloaded and transported, either unrestrained or inadequately restrained, over long distances via an inconsistent and often substandard road network.</p>	<ul style="list-style-type: none"> • Animals routinely slip and fall during loading, unloading and transit and cannot get up • Injured fallen animals are an extreme hazard and can cause other animals to fall • Reduced margins as farmers, traders and buyers absorb losses related to animals dying in transit • Food security concern related to high animal mortality rate
LOGISTICS INNOVATION	LEVEL AND NATURE OF CONSTRAINT
<p>I. Design and implementation of a pilot program utilizing a non-slip trailer floor insert which can be easily transformed to accommodate loading of other types of freight for backhaul. Several design options may include:</p> <ul style="list-style-type: none"> • Adjustable/collapsible animal cross slating livestock transport floor • Cleat floor plates • Non-slip mat inserts • Mats made from cut up used truck and car tires 	<p>LEVEL OF FINANCIAL CONSTRAINT: MODERATE LEVEL OF VCA/CULTURAL RESISTANCE: MODERATE TIMELINE: MEDIUM</p> <ul style="list-style-type: none"> • Lack of organization amongst livestock transport VCA • Lack of dedicated livestock transportation equipment • Potential added trailer weight • Trailers need to remain multifunctional to facilitate backhauls • Design must allow for proper cleaning prior to backhauling
KEY PERFORMANCE INDICATORS	CORE PARTICIPANTS
<ul style="list-style-type: none"> • Demonstrated reduction in livestock mortality rate • Increased VCA margins due to reduction in livestock mortality rate • Increased interest from VCA in expanding use of non slip flooring • Development of local market for improved designs of non slip flooring 	<p>Select Progressive:</p> <ul style="list-style-type: none"> • Livestock Selling Associations and/or Traders • Transportation Associations • Independent Truckers <p>USAID-Assist in qualifying initial design and standard operation procedures for transporting livestock</p>
COMMENTS/RECOMMENDATIONS	POTENTIAL PARTNERS
<p>Should be combined with Live Cargo Transportation Certification Program outlined in subsequent recommendation</p>	<p>Kumasi automotive engineering concerns</p>

4.2.2 DRIVER TRAINING – CERTIFICATION PROGRAM LIVESTOCK TRANSPORTATION

DESCRIPTION OF CURRENT SITUATION	RESULTING CONCERNS
<p>I. Whether from lack of education, training , incentives and/or indifference the VCA routinely allow vehicles to:</p> <ul style="list-style-type: none"> • Be improperly loaded • Depart with improper loading densities • Be operated by drivers with inadequate live cargo driving skills • Depart with improper or lacking certification, authorization and other related documentation • Be driven through dense urban traffic and in inclement weather conditions 	<ul style="list-style-type: none"> • Reduced margins as farmers, traders and buyers absorb losses related to animal weight reduction, injury or death in transit • Food security concern related to high animal mortality rates
LOGISTICS INNOVATION	LEVEL AND NATURE OF CONSTRAINT
<p>I. Design and implementation of live cargo driver training certification program where transportation VCA are trained in:</p> <ul style="list-style-type: none"> • Proper loading and unloading techniques • Loading densities • Species/type separation • Safe driving skills/habits consistent with transporting live cargo • Use of traffic and weather information • Animal behavior idiosyncrasies • Downed animal handling techniques • Proper documentation 	<p>LEVEL OF FINANCIAL CONSTRAINT: LOW LEVEL OF VCA/CULTURAL RESISTANCE: MODERATE TIMELINE: MEDIUM</p> <ul style="list-style-type: none"> • Lack of problem recognition and resulting financial implications • Lack of proper incentive and disincentive systems related to transportation VCA performance • Lack of organization amongst livestock transport VCA • Lack of dedicated livestock drivers • Lack of dedicated livestock transportation equipment
KEY PERFORMANCE INDICATORS	CORE PARTICIPANTS
<ul style="list-style-type: none"> • Demonstrated reduction in livestock injury and mortality rate when utilizing certified drivers • VCA begin to prefer certified drivers and willing to pay more • Drivers recognize value in certification and willing to pay to be certified • Local VCA take over certification program updates and upgrades 	<p>Select Progressive:</p> <ul style="list-style-type: none"> • Selling Associations and/or Traders • Transportation Associations • Independent Truckers <p>USAID - Assist in designing and authoring standard operation procedures for safe live cargo transport certification program</p>
COMMENTS/RECOMMENDATIONS	POTENTIAL PARTNERS
<p>Many developed markets have livestock transportation driver programs which can potentially be emulated</p>	<p>Agricultural University Extensions</p>

4.2.3 MOBILE ABATTOIR

DESCRIPTION OF CURRENT SITUATION	RESULTING CONCERNS
As a result of the underdeveloped cold chain and transportation network, abattoir VCA are routinely placed well forward in the value chain and often attached to the livestock markets	<ol style="list-style-type: none"> 1. High rates of weight loss and mortality due to herding animals over long distances and then transporting them into urban and semi-urban areas often via substandard vehicles over inconsistent road network. 2. Outside of the state-run abattoir network, the VC is characterized by informal and under-regulated slaughtering environment lacking formalized processes and procedures leading to: <ul style="list-style-type: none"> • Unsanitary conditions • High animal stress • Lack of traceability • Lack of systemic confidence amongst downstream VCA
LOGISTICS INNOVATION	LEVEL AND NATURE OF CONSTRAINT
<ul style="list-style-type: none"> • Identify and encourage network of progressive livestock VCA and/or associations willing to participate in identifying funding options and defining operations related to a small network of mobile abattoir units to be located at or near farm gate • Coordinate: <ul style="list-style-type: none"> ▪ Training of Mobile unit operation ▪ Standard abattoir processes and procedures including HACCP program ▪ Understanding requirements of parallel value added market opportunities and related economics ▪ Development and execution of marketing programs focused on higher end market outlets 	<p>LEVEL OF FINANCIAL CONSTRAINT: HIGH LEVEL OF VCA/CULTURAL RESISTANCE: MODERATE TIMELINE: MEDIUM</p> <ul style="list-style-type: none"> • Limited financing options • Ownership and sharing of equipment amongst VCA • Safe transport of unit over substandard road network • Cultural norm to slaughter close to end user market • Government Certification of Mobile Unit • Lack of market intelligence for high-end and processed retail opportunities • Lack of training in value added butchering • Limited cold chain equipment and logistics capabilities
KEY PERFORMANCE INDICATORS	CORE PARTICIPANTS
<ul style="list-style-type: none"> • Progressive VCA recognize opportunities in value added markets and their related economics • Increased interest from VCA in purchasing additional units • Increased demand for innovative products marketed by regional VCA • Increased innovation in introducing cold chain solutions 	<p>Select Progressive:</p> <ul style="list-style-type: none"> • Livestock farms and/or associations/retailers • Transportation Associations • Financial Institutions <p>USAID to assist locating appropriate mobile units and explore financing options</p>
COMMENTS/RECOMMENDATIONS	POTENTIAL PARTNERS
Wild game mobile processing units might be applicable	<ul style="list-style-type: none"> • Regional National Agricultural Ministries • Local Municipalities • Agricultural University Extensions • Multinational retailer and food service concerns

4.2.4 SEAFOOD CONTAINER BACKHAULS

DESCRIPTION OF CURRENT SITUATION	RESULTING CONCERNS
<p>Livestock VC remains underdeveloped in large part due to the lack of a cold chain which primarily follows VC direction of animals being moved from the north to cities in the south and/or on the coast.</p>	<ul style="list-style-type: none"> • Livestock herded and subsequently transported long distances in substandard vehicles over inconsistent road network • Livestock markets and abattoir network located in unsuited and congested urban and suburban zones • Number of non-value-added intermediaries add to final costs • Poor reputation of VC limits current VCA to the lowest margin retail trades • Food security concern related to high animal mortality rates
LOGISTICS INNOVATION	LEVEL AND NATURE OF CONSTRAINT
<p>Create a cost, logistics and marketing model for selling properly butchered meats to higher end retails by utilizing the refrigerated seafood containers which are purported by transportation associations to move seafood from the Tema port area to cities in the north then returning for the most part empty as they pass through prime livestock regions.</p>	<p>LEVEL OF FINANCIAL CONSTRAINT: MODERATE LEVEL OF VCA/CULTURAL RESISTANCE: HIGH TIMELINE: MEDIUM</p> <ul style="list-style-type: none"> • Containers reportedly owned and operated by private companies • Liability and insurance concerns for operating third parties equipment • Requires tremendous coordination amongst VCA as not to idle physical assets • Containers may not be optimal to make local meat deliveries
KEY PERFORMANCE INDICATORS	CORE PARTICIPANTS
<ul style="list-style-type: none"> • Progressive retailers and food service concerns recognize regional VC is capable of servicing their trade and willing to accept higher price • Live stock VCA realize higher margins • Viability of the model and the resulting synergetic relationships encourage development of additional similar innovative equipment sharing programs • Increased demand for innovative products marketed by regional VCA 	<ul style="list-style-type: none"> • Seafood companies • Select Progressive: <ul style="list-style-type: none"> ◆ Livestock farms and/or associations ◆ Transportation Associations ◆ Financial Intuitions • USAID to assist in: <ul style="list-style-type: none"> ◆ Developing initial pilot program and financial and operating models ◆ Presentation to Seafood Companies ◆ Presentation to Retailers and Food Service concerns
COMMENTS/RECOMMENDATIONS	POTENTIAL PARTNERS
<p>Suggest survey of other refrigerated equipment transiting through Tema port</p>	<ul style="list-style-type: none"> • Regional National Agricultural Ministries • Multinational Retailer and Food Service concerns • Agricultural University Extensions

ANNEX 1-DESK REVIEW

EXISTING USAID ATP AND E-ATP STUDIES UTILIZED IN THE REVIEW:

- Market Logistics Infrastructure-Livestock FY10
- Market Logistics Infrastructure-Maize FY10
- ATP Livestock Transport and Logistics Study FY11
- Livestock Target Interventions in Market Logistics Infrastructure and PPPs
- Market Logistics Infrastructure Maize FY11
- Transport Cost Assessment by VC Rice FY 10
- Transport Cost Assessment by VC Millet/Sorghum FY 10
- Package of Best Practices-Millet/Sorghum FY 11
- Highest Priority Road Infrastructure Investments FY10
- ATP Backhaul Study Survey

ANNEX 2-EQUIPMENT INFORMATION

LINKS TO FURTHER INFORMATION REGARDING EQUIPMENT ENHANCEMENTS REFERRED TO IN RECOMMENDATIONS:

1. Mobile Abattoir:

- <http://www.mobileslaughter.com/>
- http://www.abachemeng.com/mobile_slaughter_hall.php
- <http://yukonfood.com/AbattoirManual.pdf>
- http://www.kometos.com/site?node_id=168&language=en
- <http://www.emirates247.com/news/emirates/mobile-abattoirs-to-meet-rush-2010-11-12-1.316656>
- <http://www.nytimes.com/2010/05/23/magazine/23food-t-000.html>
- http://raparadiseranch.blogspot.com/2010_02_01_archive.html

2. Portable Grain Dryers:

- <http://www.gtmfg.com/downloads/colorcatalog.pdf>
- <http://www.gtmfg.com/dryervideo.cfm>
- <http://www.vavrinainc.com/neco.htm>